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[Genomics Research] Crystal Structure of Staphylococcus Aureus Transglycosylase Complex Provides New Direction for Antibacterial Drug Design

[Genomics Research] Crystal Structure of Staphylococcus Aureus Transglycosylase Complex Provides New Direction for Antibacterial Drug Design (Chinese Version)

Academia Sinica Newsletter (2012/04/23) A research team co-led by Academia Sinica President Chi-Huey WONG and Dr. Che Alex MA, an Associate Research Fellow at the Genomics Research Center, Academia Sinica recently solved the crystal structure of the enzyme Staphylococcus aureus transglycosylase in complex with its substrate lipid II analog. This finding provides a detailed understanding of the enzyme that is widely believed to be an excellent alternative antibiotic target, and a new direction for antibacterial drug design. The study was published in the US scholarly journal Proceedings of the National Academy of Sciences on April 9, 2012.

Many currently used antibiotics were developed to target the enzyme transpeptidase, a major component of the bacteria cell wall that is essential to bacterial survival. However, in recent years, mutations in transpeptidase and other changes have resulted in antibiotic resistant bacteria. Another bacteria cell wall enzyme, transglycosylase, is considered an alternative target for antibiotics, but, to date, no antibiotics have been developed to target this enzyme. Examination of several drug-resistant bacteria revealed no genetic mutations in the transglycosylase area, suggesting that new antibiotics developed to target transglycosylase may be less prone to resistance development.

A research team at the Genomics Research Center recently solved the crystal structure of Staphylococcus aureus transglycosylase together with its substrate lipid II analog and conducted various related mechanistic studies. This information provides new essential understanding of transglycoslase-catalyzed lipid II polymerization and therefore lays the foundation for development of inhibitors of the enzyme as antibiotics.

Related Website:
http://www.pnas.org/content/early/2012/04/05/1203900109.abstract.

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Further Information:
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